

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

SPP resonance and transmission enhancement of 1D slit array on aluminum film at microwave regime MYEONG-WOO KIM, TEUN-TEUN KIM, JAE-EUN KIM, HAE YONG PARK, Department of Physics, KAIST, 373-1 Guseong-dong, Yuseong-gu, Daejeon, Korea, DEPARTMENT OF PHYSICS, KAIST TEAM — In this presentation, we show the transmission enhancement through periodic slit arrays on a metallic film experimentally measured in the microwave regime. Enhanced transmission peaks and sharp transmission dips are clearly observed near the surface plasmon polariton(SPP) resonance frequencies calculated theoretically. The measured transmittance spectra exhibit considerable dependence on the geometrical properties of slits such as slit width, slit periodicity and metallic film thickness. Transmission peaks and dips are originated from the coupling between the incident light and SPPs which are caused by the slit array which acts like a grating coupler. Obtained results are theoretically explained by solving the Maxwell's equations and the diffraction theory with appropriate boundary conditions, which are in excellent agreement with those calculated by the finite-difference time-domain method.

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Date submitted: 02 Dec 2008

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